



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,394	07/15/2003	Takashi Yoshitomi	790001-2016.1D	7677

7590 04/21/2004

FROMMER LAWRENCE & HAUG LLP
745 FIFTH AVENUE
NEW YORK, NY 10151

EXAMINER

WILSON, CHRISTIAN D

ART UNIT PAPER NUMBER

2824

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/619,394

Applicant(s)

YOSHITOMI ET AL.

Examiner

Christian Wilson

Art Unit

2824

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/093,114.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7152003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: search history.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it is too short and uses legal language. Correction is required. See MPEP § 608.01(b).
2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: MIM Capacitor with Diffusion Barrier.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 11 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saenger *et al.* in view of Barth *et al.* as supported by the *CRC Handbook of Chemistry and Physics*.

Saenger *et al.* (US 5,633,781) teaches a process of manufacturing a semiconductor device comprising the steps of forming a first insulating film **14, 12**, removing a selected portion of the first insulating film [Figure 5B] to form an opening **26**, forming a capacitor at a selected position in the opening [Figure 5G], and forming a second insulating film in the opening **36**. Saenger *et al.* does not discuss forming a third insulating film on the second insulating film. Barth *et al.* (US 6,451,664) teaches the step of forming a third insulating film over a capacitor [Figure 9]. It

Art Unit: 2824

would have been obvious to one of ordinary skill in the art to form a third insulating film over the second insulating film of Saenger *et al.* since Barth *et al.* teaches that this film provides passivation for the capacitor [column 7, lines 10-25].

Regarding claim 12, Saenger *et al.* further teaches forming a diffusion preventing film 8 on which the first insulating film is formed.

Regarding claim 13, Saenger *et al.* further teaches forming a diffusion preventing film between the capacitor and the second insulating film [column 6, line 6].

Regarding claim 14, Saenger *et al.* further teaches forming a diffusion preventing film 8 on which the first insulating film is formed and forming a diffusion preventing film between the capacitor and the second insulating film [column 6, line 6].

Regarding claim 15, Saenger *et al.* further teaches a laminated film of the low dielectric first insulating film and diffusion preventing film [column 4, line 28].

Regarding claim 16, Saenger *et al.* teaches second insulating film comprising a high dielectric film (Al_2O_3). Barth *et al.* teaches a low dielectric third insulating film (SiO_2). The examiner takes official notice that the dielectric constant of Al_2O_3 is higher than that of SiO_2 [see supporting reference from *CRC Handbook of Chemistry and Physics*]. It would have been obvious to one of ordinary skill in the art to use the low dielectric third insulating film of Barth *et al.* in the method of Saenger *et al.* since Barth *et al.* teaches SiO_2 is the preferred dielectric material for a passivation layer.

Regarding claim 17, Saenger *et al.* teaches a second insulating film comprising a coated organic insulating film [column 6, line 7].

Art Unit: 2824

Regarding claim 18, Saenger *et al.* teaches a capacitor which is thinner than the first insulating film [column 4, lines 30 and 54; Figure 5I].

Regarding claim 19, Saenger *et al.* further teaches a second insulating film formed only in the opening [Figure 5I].

Regarding claim 20, Saenger *et al.* further teaches forming the second insulating film on the first insulating film and capacitor and flattening the second insulating film by CMP [column 6, line 9] until the surface of the first insulating film is exposed [Figure 5I].

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Petrarca *et al.* teaches an upper and lower diffusion barrier. Yoshitomi *et al.* is the parent patent for the instant application.

7. A copy of the search history (EAST and STN) is enclosed.

Art Unit: 2824

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian Wilson whose telephone number is (571) 272-1886.

The examiner can normally be reached on weekdays, 7:30 AM to 4 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Elms can be reached on (571) 272-1869. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Christian Wilson, Ph.D.
Patent Examiner
Art Unit 2824

CDW